

Some Special Right Triangles and Applications

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Abstract

Posing interesting questions is important, but usually harder than solving them, even in elementary algebra and geometry. With that in mind, suppose $\triangle ABC$ is a right triangle, $\angle C$ is the right angle, and, of course, $a^2 + b^2 = c^2$ from the Pythagorean theorem. This article considers the following questions: Are there right triangles, other than the 3-4-5 right triangle, whose sides are consecutive integers? If not, how do we know there are none? More generally, are there other right triangles whose sides are in arithmetic progression? Are there right triangles whose sides are in geometric progression? Finally, can we find all right triangles, with integral sides, such that area equals perimeter?



Michael W. Ecker, who retired recently, was an associate professor of mathematics at Pennsylvania State University, Wilkes-Barre. He received his PhD in mathematics from the City University of New York in 1978. He has published regularly as a traditional mathematician, recreational mathematician, problem solver, and computer journalist in numerous publications. He served on several national committees responsible for creating competitive national exams. For 21 years, he wrote, edited, and published his own newsletter, *Recreational & Educational Computing*, featuring the interplay of mathematics, computers, and recreations. He is the author of over 500 newsletters, columns, reviews, articles, and books.